

## LETTERS TO THE EDITOR

### Sports drinks and teeth

EDITOR,—In a previous issue of this journal Dr Milosevic published an article entitled "Sports drinks hazard to teeth". The article described the erosive potential of sports drinks based on an analysis of pH and buffer capacity. Moreover, a case was presented of an athlete who had appreciable dental erosion due to regularly drinking a still isotonic sports drink from a pouch. Both the title and the case presented gave the reader the impression that there is a direct relation between sports drink consumption and dental damage.

We consider that the article contains erroneous and misleading information.

#### FALSE pH VALUE

The author gave the pH of Isostar (a powder based drink) as 2.38 (the lowest value of all the drinks listed)! This figure is wrong and must be based on either a wrong measurement, typing errors, or testing of an old product no longer marketed. Actual measurements by Professor JM ten Cate, Department of Cariology and Endodontology, Academic Centre for Dentistry (ACTA), Amsterdam, the Netherlands, as well as measurements in our own laboratories of all Isostar powder and liquid products in stock at the moment in England (24 March 1997), confirm that the true pH values for Isostar powder based drinks are: lemon pH 4.1, orange pH 4.08. The liquid products have comparable values.

Results from an internal study at ACTA, Amsterdam, finished in 1994, showed that Isostar orange with a pH of 4.0 and a relatively low buffer capacity caused appreciably less erosion than a variety of other tested soft drinks—namely, fruit juices and competitive sports drinks (ten Cate JM, unpublished data). Moreover, it was shown that mixing the drink with artificial saliva (10 and 50% mixtures) results in a pH that is even above the critical pH of 5.5. Based on these data Novartis Nutrition decided to set the pH of all Isostar drinks at 4.0, while having a relatively low buffer capacity. These facts about Isostar are in marked contrast to the impression made by Dr Milosevic's article, which meanwhile has been cited by the international press.

#### NO DIRECT EVIDENCE

Dr Milosevic presented no direct evidence on a relation between sports drink consumption and dental erosion as can be seen by the following phrases from the article:

- "Sport drinks had the same cariogenicity as fruit juice and carbonated beverages.<sup>7</sup> However, levels of decay were not significantly different between a group of Swedish school athletes and a non-athletic control group." (page 28)
- "A five day fluid intake record showed that hot beverages were rarely consumed, the subject (of the dental damage case presented) preferring fresh fruit juice and carbonated beverages." (page 29)
- "... erosion cannot be attributed unequivocally to the sports drink since the subject (from the case presented) also drank fresh

fruit juice and carbonated beverages. Such drinks are potentially erosive..." (page 30)

• "Ranking the erosive potential of the sports drinks is thus difficult..." (page 30). Thus it must be concluded that the author fails to support his opinion with direct evidence. Moreover, the citation of an incorrect pH value has in an unacceptable way brought discredit to the product Isostar—a product that is based on sound scientific research, including the aspect of dental erosion.

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1 Milosevic A. Sports drinks hazard to teeth. *Br J Sports Med* 1997;31:28-30.

### Author's reply

EDITOR,—I would like to respond to the above letter from Drs Brouns and Muntjewerf of Novartis Nutrition AG about my recent article "Sports drinks hazard to teeth".<sup>1</sup> They make a number of points with which I must take issue.

I refute the suggestion that my paper contained erroneous and misleading information. Having repeated the Isostar pH measurement, I am satisfied that the results of the tests that were performed on all of the drinks under consideration were accurate, including the pH values.

As mentioned in the article the calcium, phosphate, and fluoride concentrations of the drinks were examined as well, which are all relevant factors when considering potential for dental erosion.

I did not single out Isostar from the other drinks under examination, still less did I discredit it as a product. In fact, Isostar came out of the study favourably as the relatively high concentrations of calcium and phosphate in the drink would, as I said in the article, tend to reduce any erosive potential.

I consider my paper to be well balanced and, read as a whole, my message to the profession was clear. The results of my study corroborate the findings of earlier papers that these types of drink have the potential to cause dental erosion. There is, in my view, need for greater awareness of this issue and also for further research.

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1 Milosevic A. Sports drinks hazard to teeth. *Br J Sports Med* 1997;31:28-30.

### Doping in sport : doctors are providing drugs

EDITOR,—Studies dedicated to doping in sport have until now concentrated on events after the use of banned substances: drug testing, side effects, etc. On the other hand, few works have examined what happens before this abuse. An understanding of what happens

Table 1 Doping in adult amateur sports: sources of drugs according to athletes

Sources of drugs	Drugs users (%)
Doctor/general practitioner	61
Black market	20
Proximity network	15
Other	4
Total	100

before their use might, however, help to create new tools that would perhaps allow more effective prevention of doping.

With this in mind, we focused our attention on an unexplored subject—namely, how adult amateur athletes obtain illicit drugs.

#### METHODS

During a study among 2000 French amateur athletes of both sexes aged 17 and above, 186 subjects admitted that they had used prohibited substances in the previous 12 months, and 73 agreed to answer a questionnaire on the way they had obtained these drugs, provided that their anonymity was strictly respected. The working sample comprised 58 men and 15 women aged between 17 and 45 years (mean (SD) 25.8 (6.9)), including seven elite athletes and 66 athletes involved in national or regional level events (no body builders and no power athletes). The drugs used were stimulants (46%), narcotics (29%), corticoids (9%), anabolic-androgenic steroids (4%), diuretics (4%), and other (8%). Use of more than one drug was reported by 13 athletes. Three subjects used drugs without knowing their names.

#### RESULTS

Subjects obtained drugs through three main networks: doctors, the black market, and the proximity network (table 1).

Drugs prescribed by a doctor (that is, stimulants, corticoids, anabolic-androgenic steroids, diuretics) were quoted by two thirds of the subjects (61%). Their usual general practitioners were most often the prescriber and, according to the athletes, the prescription was usually written with the full knowledge of the doctor during routine consultation. In six cases, however, the prescription was obtained by giving the excuse of a disease or a previous injury, as prescribing anabolic steroids to athletes is ethically unacceptable in France. Systematically, the doctor delivered the prescription within the framework of the national health insurance scheme, in other words the cost of the drugs was reimbursed by social security.

The black market was used by one fifth (20%) of the subjects, particularly for narcotics such as cannabis and cocaine. The suppliers were "traditional" dealers met outside stadiums.

The proximity network allowed the acquisition of drugs from people within a close circle—coaches, team mates, or relatives, and was quoted by 15% of the athletes.

#### DISCUSSION

General practitioners do encounter doping in sport: in France, one in three during the past 12 months.<sup>1</sup> In 1991, of 517 family doctors and paediatricians in Texas, 55% reported being asked about steroids or seeing possible steroid users in their practices during the previous five years.<sup>2</sup> Finally, a number of doctors prescribe prohibited drugs through intention or being fooled by the athlete making the request.<sup>3</sup> Practitioners must therefore improve their knowledge of doping, and con-

sider it in the same way as any other health problem. This would mean taking into account the factors that encourage it as well as the clinical symptoms, desired effects, immediate or delayed complications, therapeutic acceptance, and social implications. In other words, doctors must change their attitude to doping in order not to limit this subject merely to a question of a list of banned substances. Moreover, doping should form an integral and specialised part of the studies undertaken by every medical student. This is urgently required considering the fact that doping agents such as anabolic steroids, human growth hormones, and stimulants are also used by people not taking part in sports.

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- 1 Laure P. Médecins généralistes et dopage sportif: connaissances et attitudes. *Santé Publique*. In press.
- 2 Salva PS, Bacon GE. Anabolic steroids: interest among parents and nonathletes. *South Med J* 1991;5:552-6.
- 3 Fessler B. Arzneimitteltherapie bei Leistungssportlern. Doping wider Willen. *Deutscher Apotheker Zeitung* 1992;31:1629.

#### Use of insulin as an anabolic agent

EDITOR,—We are writing to alert you to a problem that we are seeing in our drugs in sport clinic—namely, the increasing use of insulin as an anabolic agent.

The potential for widespread use of insulin was brought to our attention in July/August of 1996 when discussions of its use were published in two bodybuilding magazines,<sup>1,2</sup> leading us to ask our patients about this.

It is difficult to estimate the current usage but at the present time six of our 200 clients have admitted to its use. Worryingly, inquiries about insulin are increasing weekly and we believe this will be a major problem in the coming months.

We have noted two different regimens of administration—namely, 10 IU of short acting insulin twice daily and, more commonly, the use of 2–15 IU of short acting insulin 20 to 40 minutes after training. With each regimen the body builder increases the intake of carbohydrate and protein with the injection.

If the insulin has not been provided on prescription it can be purchased from a pharmacist, if the pharmacist feels that the patient is indeed diabetic. The price for an "Actrapid 3 ml pen" is £9.78 including tax. This can then retail for £60 to a body builder on the "black market". In view of this potential profit we advocate maintained vigilance on

repeat prescriptions of insulin and pharmaceutical products purchased.

One of our patients was informed that he could recoup some of this outlay by selling on the unused portion of this pen. Although there will be little risk with the pen delivery system if clean needles are used, it does raise obvious concerns about the risk of hepatitis B, C, and HIV if multidose phials are used without access to a needle exchange.

Our clients have apparently little knowledge about the types of insulin and the variable rates of absorption from different injection sites. This leads to our major concern of the potential for unexpected hypoglycaemic episodes, particularly in those using anabolic steroids.<sup>3</sup>

We would like to alert all practitioners to this possibility if faced with collapsed, confused, or aggressive patients who may in fact be hypoglycaemic and require glucose or glucagon. This may be of some importance at the scene of road traffic accidents if the episode has taken the patient unawares.

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- 1 Phillips B. Uncensored questions and answers. *Muscle Media* 2000. 1996; No 51:32-3.
- 2 Kneller B. The impact of exogenous insulin on body building. *Musclemag International*. 1996; No 171: 24-34.
- 3 Reynolds JEF, ed. *Martindale: The extra pharmacopoeia*. 31st ed. London: The Pharmaceutical Press, year:353.

#### General practitioner knowledge of prohibited substances in sport

EDITOR,—May I draw your attention to an error in the article on prohibited substances in sport<sup>1</sup> by Drs Greenway published in this journal—namely, that non-steroidal anti-inflammatory drugs are cited as being banned via the intramuscular route. Firstly, non-steroidal anti-inflammatory drugs are not listed in the International Olympic Committee's list of prohibited substances in the current document dated 31 January 1997 and to my knowledge never have been, therefore doctors can feel free to prescribe this group of drugs without fear of the recipient being in breach of the IOC's regulations.

Secondly, in the most recent IOC list published on the 31 January 1997 dextropropoxyphene has been removed together with propoxyphene and ethylmorphine. It is there-

fore quite in order for an athlete to take co-proxamol.

This merely highlights the difficulty that general practitioners face when dealing with athletes liable to be dope tested and the need for doctors to check regularly each year the IOC's current listing.

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- 1 Greenway P, Greenway M. General practitioner knowledge of prohibited substances in sport. *Br J Sports Med* 1997;31:129-31.

EDITOR,—I can empathise with the findings of Drs Greenway<sup>1</sup> about general practitioner knowledge of prohibited substances in sport having recently found two athletes at a national championship who had been unknowingly prescribed banned medicines.

The Modahl case has highlighted the potential for litigation after positive dope tests. It is likely that at some time a competitor will test positive having been prescribed a drug by a medical practitioner. As the number of professional sportsmen and women increases it will become more likely that this error will result in a claim for compensation that might be considerable. Ignorance is not usually an adequate defence in law and it would be interesting to know the medical defence societies' views on this hypothetical situation.

The authors point out that there is a one page summary included in the *British National Formulary* of doping classes, but only one third of respondents were aware of this. Possibly, a better solution would be to use a symbol system, similar to that used for gluten-free items, to bring it to the attention of general practitioners that the drug may be a prohibited substance. This would refer the general practitioner to a more complete explanation of the list of banned substances for situations during and out of competition. The Sports Council Drug Advisory Service should be contacted if in any doubt. I do not think we should wait for the first "test case" of this scenario, but the British Association of Sport and Medicine should act as a responsible body and promote awareness of the potential problems.

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- 1 Greenway P, Greenway M. General practitioner knowledge of prohibited substances in sport. *Br J Sports Med* 1997;31:129-31.